

ENVIRONMENTAL Fact Sheet



Wyckoff / Eagle Harbor, Bainbridge Island, Washington

U.S. Environmental Protection Agency, Region 10

May 2004

Wyckoff Cleanup: EPA Looking at Data and Options

Reviewing Options for Moving Forward New Groundwater Treatment Plant Being Designed

EPA HAS STOPPED THE STEAM-INJECTION CLEANUP TESTING at the Wyckoff Superfund site on Bainbridge Island. The steam pilot project encountered technical challenges some months ago, relating to the water and vapor-treatment systems. Since that time, EPA has been studying the results to determine the best path forward. Information gathered during the steaming operations will be considered in an ongoing engineering evaluation to explore all options for moving forward. The engineering evaluation will look at both a thermal cleanup option and a containment option. The evaluation is expected to be completed this summer. A report of findings will be made available to the public.

EPA remains committed to the long-standing cleanup goals for protection of human health and the environment. These goals are outlined in the 2000 Record of Decision (ROD). The ROD called for a thermal steam-injection cleanup test in one acre of the Former Processing Area, followed by an evaluation of the appropriateness of thermal treatment for the remaining cleanup area. We are now in that evaluation stage. As stated in the ROD, in the event that thermal treatment is found to be inappropriate for this site, a containment remedy of capping the site with a barrier of clean material would be put in place.

The thermal steam-injection project was an ambitious state-of-the-art pilot test, and EPA learned a great deal. Initial results from the pilot show that injection of steam may be an effective way to remove creosote contamination from the groundwater and

soils. However, the pilot system was unable to handle the high volume of heavily contaminated groundwater and vapor.

EPA has not ruled out full-scale thermal treatment. Full-scale steaming would not be pursued unless a successful pilot had been completed. The Agency is now considering what changes to the treatment system would be required if more steam injection is found to be suitable. EPA, in coordination with the other agencies, is also looking at cleanup requirements for compliance with regulatory standards.

The proposal for the long-term approach at the site will be based on the engineering evaluation. EPA will ensure that future land-use plans are considered in the remaining cleanup efforts. Input from the City of Bainbridge and the local community will help shape EPA's decisions as work moves ahead on this site.



The aging groundwater treatment plant needs to be replaced.

So What Were the Problems?

EPA ENCOUNTERED SEVERAL PROBLEMS WITH THE CLEANUP TEST, WHICH BEGAN IN OCTOBER 2002. Injection of steam underground mobilized high concentrations of creosote and wood-treating chemicals. These contaminants were extracted in both vapor and liquid form.

Naphthalene

AN ISSUE COMMON TO BOTH THE VAPOR AND GROUND-water streams was the presence of naphthalene in the Wyckoff creosote. The chemical naphthalene is not compatible with rubber. Rubber seals and gaskets throughout the plant failed early in the steaming process. One critical piece of equipment that failed was the “vapor-phase heat exchanger,” which was designed to condense highly contaminated vapors. Without this heat exchanger, the rate of injection of steam needed to be cut back dramatically. In the groundwater treatment plant, seal and gasket failures made it difficult to separate oil products from the rest of the contaminated water.

In addition, naphthalene solidifies at a relatively high temperature, which caused rapid clogging of equipment and transfer lines in both the vapor-collection system and groundwater-treatment system.

An Aging Groundwater Treatment Plant

THE AGING GROUNDWATER-TREATMENT PLANT, WHICH WAS built by the Wyckoff Company in the 1980’s, was not able to handle the much higher levels of contaminants extracted during the thermal pilot. The treatment plant uses a biological system in which microscopic organisms (or “bugs”) break down the contaminants. Biological systems can fail as a result of sudden changes, such as the much higher contaminant levels that came through the system during steaming. In the early stages of the pilot, the biological process did fail and the bugs had to be re-populated.

The treatment plant is experiencing many other mechanical and structural failures. No matter how the cleanup proceeds at this site, replacement of this aging plant is first priority.



The chemical naphthalene clogged the pipes. Note the crystals in the inner ring.

Ability to Treat Extracted Vapors

THE THERMAL PILOT DATA SHOW THAT A VERY HIGH volume and concentration of vapors would need to be collected and treated during steaming. An evaluation is underway to determine what changes to the vapor collection/treatment system would be required for future pilot or full-scale steaming operations. In addition, EPA also needs to make sure that the treatment of the pentachlorophenol that was mixed into the Wyckoff creosote does not produce contaminants that could be released to the atmosphere.

Steam-Injection Wells

THE PILOT STUDY INDICATED THAT ADDITIONAL WELLS WILL likely be needed to heat the area of contamination completely. Because the injected steam tends to move upward toward the surface, rather than outward, more injection wells may be required to heat the pilot area entirely. EPA is evaluating the option to heat the lower portions of the aquifer to reach the deepest contamination. The effect of additional wells on the capacity of the vapor and groundwater treatment system also needs to be considered.

Looking Ahead

THE WYCKOFF TEAM IS NOW TAKING STOCK OF THE CHALLENGES AHEAD. EPA's immediate priorities at this site are changing. Even as EPA carefully works to make decisions about cleanup through the engineering evaluation process, the Agency must deal with some more pressing questions. Some of those issues are outlined below.

1st Priority—Operating the Existing Groundwater Treatment Plant

EPA must continue to operate the existing groundwater treatment plant to prevent groundwater releases into the environment and to ensure compliance with surface-water discharge standards. This is a significant effort given the state of the aging treatment plant, requiring frequent repairs of failing equipment.

2nd Priority—Replacing the Groundwater Treatment Plant

No matter how the cleanup proceeds at this site, the treatment plant must be replaced. Its parts are aging, and its capacity is limited. EPA plans to propose a design of a new treatment plant by summer 2004. The new plant could be in place by summer 2005.

3rd Priority—Reducing Rates of Groundwater Pump and Treat

The need to replace the groundwater treatment plant raises the question, "How big should it be?" There are four major considerations: (1) clean groundwater flowing into the site from the hillside; (2) rainfall and surface water runoff infiltrating the site soils; (3) groundwater coming up from the lower aquifer into the upper aquifer; and (4) contaminated water coming from additional steaming operations. To reduce the cost of treating groundwater that is not from steaming operations, EPA is evaluating ways to reduce the capacity needs of a new groundwater treatment plant as follows:

A: Fully Enclosing the Site with Cutoff Wall

The site is surrounded on three sides by a sheet-pile wall. The wall extends deep underground along the harbor to hold in the contamination. On the fourth side to the south, against the hillside, groundwater flows into the site, mingling with the contamination underground. This extra groundwater must be processed through the treatment plant. EPA believes that it makes sense to extend this sheet-pile wall so that it fully encloses the site, thus reducing the need to treat this water.

B: Capping the Site

EPA is evaluating the possibility of placing a "cap," or barrier of material, over the site to reduce the amount of rain draining into the contaminated soil. This extra water becomes contaminated and must be processed through the treatment plant. Under the engineering evaluation, EPA is considering different types of caps that would reduce infiltration, including designs that could be consistent with any future thermal treatment efforts.

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Other Issues Under Evaluation

Sheet-Pile Wall Protection:

THE SHEET-PILE WALL IS EXPERIENCING CORROSION IN the intertidal zone. This corrosion likely will reduce the sheet pile's ability to control contaminant movement. The site team is considering ways to prevent contaminant movement, including a shallow interior sheet-pile wall, clay walls, or sealers or sand and riprap on the outside edge. An analysis of these options will be part of the engineering evaluation.

Compliance with Water Standards:

EPA IS REQUIRED TO MEET STATE CLEAN WATER standards at the edge of the sheet-pile wall, which is called a "point of compliance." Any water that potentially seeps through the wall must be clean enough to meet standards. No violations have been noted. However, since this is a very contaminated site, this requirement poses a challenge. EPA is working with the State of Washington Department of Ecology to determine the best approach for regulatory compliance. This understanding is critical to setting soil and groundwater cleanup standards at the Wyckoff site.

Community Information Meeting Coming Soon

EPA REMAINS COMMITTED TO DEALING WITH THIS SERIOUSLY CONTAMINATED SITE. Determining the appropriate path forward will require a careful evaluation of each option through the engineering evaluation.

EPA will host a Community Information Meeting sometime this spring or summer to discuss options developed during the evaluation process. The meeting will provide a chance to discuss the latest news about the Wyckoff cleanup project and to hear community views on moving forward. Stay tuned for more information.

Site Background

EPA LISTED WYCKOFF/EAGLE HARBOR AS A Superfund site in 1987. The former Wyckoff wood-treating facility, located at the mouth of Eagle Harbor on Bainbridge Island, operated from the very early 1900s to 1988. Soils at the facility, and groundwater beneath it, are severely contaminated. Contaminants include creosote and other wood-treatment compounds. About one million gallons of creosote product remain in the site's soil and groundwater. These contaminants pose a risk to public health and the environment.

A groundwater extraction-and-treatment system has been operated on site since 1990. However,

contaminants were still moving into the marine environment until a sheet-pile wall was installed in 2001. EPA is testing thermal treatment technologies to clean up remaining soil and groundwater contamination.

In Eagle Harbor, bottom sediments were severely contaminated with chemicals from wood-treating and shipyard operations. A public health advisory recommends against eating fish and shellfish from the harbor. From 1993 to 2002, contaminated sediments in various locations were capped with clean material.

Wyckoff Team Welcomes New Member

LONG-TIME EPA SUPERFUND PROJECT MANAGER **WALLY REID** RECENTLY JOINED THE WYCKOFF TEAM. Wally, an environmental engineer, has been with EPA ten years. He is excited to be joining the team.

For More Information

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EPA Web Site:

www.epa.gov/r10earth/ Click on "Index," then click on "W" for Wyckoff.

Documents:

The Administrative Record is a file that contains all information used by EPA to make decisions about the cleanup. The Administrative Record can be reviewed at the EPA Records Center, 7th Floor, 1200 Sixth Avenue, Seattle. Call (206) 553-4494 to make an appointment.

Some documents can be viewed at the Information Repository located at the Bainbridge Island Public Library, 1270 Madison Avenue North. If the library does not have the document you need, feel free to call Andrea Lindsay, EPA Community Involvement Coordinator, at (206) 553-1896.



Alternative formats are available upon request. Call Andrea Lindsay at the number above to request reasonable accommodation. TTY users call 1-800-877-8339.

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